



## **Idaho Explosives Detection System (IEDS): New system detects explosives**

Even before the attacks on September 11, 2001, security challenges were expanding rapidly.

This new reality demanded many new technologies for the variety of conditions involving buildings, vehicles, aircraft and vessels.

Use of explosives by terrorists makes detection and confiscation to thwart attacks even more important throughout the world.

An Idaho National Laboratory team has answered a key military request, which was to invent an accurate, easy-to-use and practical system to inspect vehicles and cargo for explosives without endangering inspectors or bystanders.

“The Idaho Explosive Detection System, called IEDS, uses two pulsed deuterium-tritium neutron generators to interrogate an object and determine within minutes whether it contains explosives,” said Jeff Klinger, program manager for the IEDS project.

The entire process takes no more than five minutes, the time it normally takes the driver to complete his delivery paperwork.

IEDS can be easily disassembled and transported to another location. It positions neutron generators and detectors on either side of a vehicle. These “racks” incorporate proximity switches to prevent the system from coming into contact with vehicles, while ensuring the detection capability of the system is maximized by being as close to the interrogated vehicle as possible.

Then, the generators are remotely activated from a safe distance. The high-energy neutrons interact with explosives to release signature gamma rays.

The gamma rays are measured by detectors in parallel rows on either side and the data is analyzed using an innovative set of statistical algorithms.

No interpretation is required. IEDS says explosives are present or absent by indicating “SUSPECT CARGO or ALL CLEAR.”

“IEDS leverages today’s fast small computers and cheaper, yet more reliable, neutron generators to achieve detection with high accuracy,” said Klinger.

Once the operator has received the “ALL CLEAR,” then the racks are opened and the driver is permitted to continue. Suspect cargo is detained for further examination.

Capable of being powered by a small 5-kilowatt portable electric generator, the system can be disassembled within six hours and moved to a new location.

Using off-the-shelf components, IEDS has few moving parts, is easy to repair, is transportable and can quickly be upgraded. Plus, IEDS costs about half of its closest competitor at approximately \$1 million dollars, compared to about \$2 million for similar, yet less transportable capabilities.

Other systems are more complex, personnel need to be in close proximity to suspect cargo or use low-energy systems that are less accurate. Nearly all require extensive training, while IEDS requires no interpretation and the operator can be trained in one hour.

IEDS delivers an unambiguous “ALL CLEAR” or “SUSPECT CARGO” indication of explosives, avoiding complex analysis and false positives that plague other systems.

Designed to accommodate upgrades as innovations emerge, this system is easy to use, fast and costs less, plus it delivers practical and transportable inspections that save lives anywhere in the world.